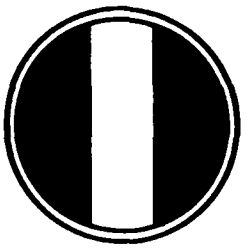


LEVEL II

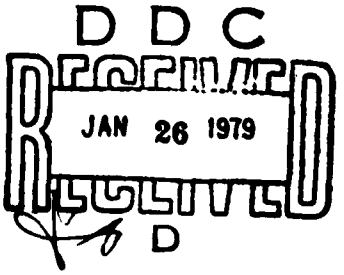
TRASANA

TECHNICAL REPORT NO. 3-78

FLIGHT PROFILE PERFORMANCE HANDBOOK

VOLUME IX – UH-1H (HUEY)

NOVEMBER 1978



DEPARTMENT OF THE ARMY
US ARMY TRADOC SYSTEMS ANALYSIS ACTIVITY
WHITE SANDS MISSILE RANGE
NEW MEXICO 88002

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WARNING

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(9) TECHNICAL REPORT NO. 3-78 — VOL-9

(6)

FLIGHT PROFILE PERFORMANCE HANDBOOK.

VOLUME IX - UH-1H (HUEY).

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At TRASANA, Mr. Frank Gonzalez provided help and guidance during the preparation of the Handbook.

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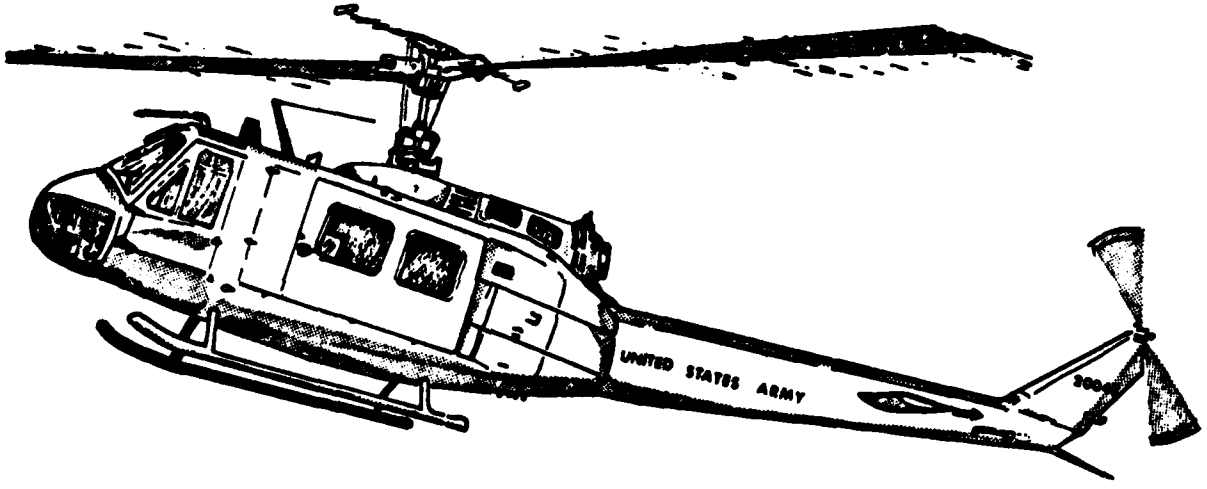


UH-1H HUEY

CHAPTER 1

INTRODUCTION

1. PURPOSE

The purpose for preparing this handbook series is fourfold: (a) to validate HUEY performance data quickly, (b) to reduce the manpower and time to prepare accurate flight profiles, (c) to standardize performance data so that the analysis community can benefit from a single reference in conducting studies and (d) to provide a handbook that can be used for training in the mission profile planning area.

2. BACKGROUND

The HUEY performance data contained in this Flight Profile Performance Handbook (FPPH) series was originally acquired as a data base for the Aircraft Mission Processing Simulation (AMPS) model. AMPS is a computer program developed by the Aviation Systems Analysis Branch of the US Army TRADOC Systems Analysis Activity (TRASANA) to support Cost and Operational Effectiveness Analyses (COEAs). AMPS generates detailed flight profiles for a wide variety of helicopter missions. The data was provided TRASANA by the Army Aviation Research and Development Command (AVRADCOM) and was the most accurate data available to AVRADCOM at the time of handbook publication. In structuring the data base for AMPS it was noted that the data, when properly organized, could provide a method of doing quick and simple flight profile simulations. This volume presents the HUEY data and explains how it can be used.

3. OBJECTIVES OF THE HANDBOOK

a. Data Validation. This volume of the handbook contains tables with the precise performance data and format required to develop flight profiles for computer simulations. Using the handbooks as a reference, the individual project manager (PM) will be able to quickly validate or update as required all associated data contained in the different tables. If this procedure is followed by the various PMs, support of Helicopter COEAs and other analyses can be efficiently implemented.

b. Flight Profile Development. Much of the manpower and time spent in preparing flight profiles for supporting aircraft COEAs is dedicated to look-up, correlation and validation of performance data. Once the procedure contained in this handbook is implemented, flight profiles can be easily prepared. What normally took one man 4 to 5 days to prepare can now be prepared in 3 to 4 hours.

c. Standardization of Performance Data. Each of the PMs has been contacted by AVRADCOM to validate the performance data contained in each handbook in this series. Once each handbook is published, the data contained will be kept current as of the publication date. Since the requests for current information are constantly being forwarded to the PMs by analysis groups, this handbook can be a reference and assure a commonality in studies within the community.

d. Training for Planning Missions and Flight Profiles. For training purposes each handbook can stand alone. It is only a matter of following the example provided and applying the proper data to fit the flight profile desired. Although the example shown is simplistic, the methodology may be expanded to apply to any flight profile no matter how complex.

4. OTHER VOLUMES

This handbook is one of a series that covers the helicopters in the US Army inventory. The complete set of handbooks and their subjects are:

Volume I - FPPH Description

Volume II - UH-60A (BLACKHAWK)

Volume III - AH-1G (COBRA)

Volume IV - AH-1S (COBRA)

Volume V - YAH-64 (Advanced Attack Helicopter [AAH])

Volume VI - OH-58C (KIOWA)

Volume VII - CH-47 (CHINOOK)

Volume VIII - CH-54 (TARHE)

Volume IX - UH-1H (HUEY)

5. GENERAL HANDBOOK DESCRIPTION

a. Performance Data. The data contained in these volumes is HUEY performance data compiled from the results of actual experiments. It is not engineering data and is not intended to serve as a base for future helicopter construction or acquisition. The more mature the helicopter becomes, the less likely there will be a change in the basic performance data.

b. Handbook Organization. This volume is one of a series of volumes as identified in paragraph 4 above. Volume I is a description of the methodology used to develop the tables for each of the other volumes. This volume and all other volumes except Volume I provides a simplified flight profile example in Chapter 2. Chapter 3 provides an explanation of each of the five types of data tables contained in the handbook. The five types of tables deal with: (1) Basic Fuel Flow Data, (2) Delta Fuel Flow for Drag Data, (3) Ground Idle Fuel Flow Data, (4) Gross Weight Limits Data and, (5) Velocity Limits Data. Chapter 4 contains the actual tables to be used for developing flight profiles.

CHAPTER 2

FLIGHT PROFILE EXAMPLE

1. GENERAL

This chapter provides an example of how to develop a flight profile, albeit simple, that can be extended to cover any number of stops, loads and distances all depending on helicopter capability and fuel available.

2. DISCUSSION

a. The main question this example of a flight profile will answer is, "Do I have enough fuel to fly the proposed mission?"

b. Suppose a pilot is to fly a simple resupply mission in a UH-1H (HUEY) helicopter that calls for flying (as shown in illustration 2-1) from point A (the air base), to point B (the pick up area) to point C (the drop off area) and return to A.

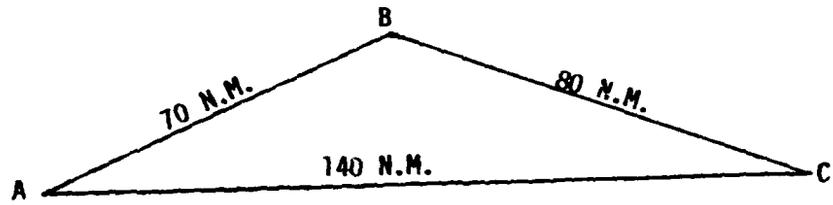


Illustration 2-1

c. The other information given is airspeed (AS) from A to B which is to be 70 knots (kts), from B to C 40 kts, and from C to A 70 kts. The HUEY helicopter is to be flown, at 4,000 ft for all legs at an ambient temperature of 15°C, and an idle altitude for take off, pick-up and drop off areas (ground level) of 2000 ft*. The mission plan also shows 10 minutes idle at A before take off, 20 minutes idle at B while loading, 20 minutes idle at C while unloading and 10 minutes idle on return to A before shut down. The HUEY will be flown at a gross weight (GW) of 6,000 lbs from A to B and from C to A, while the cargo from B to C will be 3,000 lbs.

All altitudes are in reference to sea level.

d. The flight plan is prepared by drawing up a table similar to Table 2-1 below. By filling in the blanks under fuel, it can be determined if the total is too large for the helicopter.

TABLE 2-1

Helicopter: HUEY

Altitude: 4000 ft flight/2000 ft idle

Temperature: 15°C

LEG	DISTANCE	AS	TIME	GW (lbs)	FUEL
Idle @ A	-	-	10 min	-	
A-B	70 N.M.	70 kts	1 hr	6,000	
Idle @ B	-	-	20 min	-	
B-C	80 N.M.	40 kts	2 hr	9,000	
Idle @ C	-	-	20 min	-	
C-A	140 N.M.	70 kts	2 hr	6,000	
Idle @ A	-	-	10 min	-	

e. First fill in Idle @ A, Idle @ B, Idle @ C and 2nd Idle @ A since they will all come from Table 2-2. In each case the idle is at 2000 ft and a temperature of 15°C. Consulting the ground idle fuel shown in Table 2-2, the value of 309 lbs/hr is at the intersection of 2000 ft and 15°C.

1st Idle @ A = 1/6 X 309 = 52 lbs

Idle @ B = 1/3 X 309 = 103 lbs

Idle @ C = 1/3 X 309 = 103 lbs

2nd Idle @ A = 1/6 X 309 = 52 lbs

TABLE 2-2

GROUND IDLE FUEL FLOW
AIRCRAFT - UH-1H
HUEY

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	320	303	288	274	260	246
	-5 C	323	306	291	277	264	250
	15 C	326	309	294	280	268	254
	35 C	330	312	298	284	271	259

ENTRIES ARE AIRCRAFT FUEL FLOW RATES IN LBS/HR

TABLE 2-3

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	459	476	439	402	403	425	481	565	682	872
6,000	497	521	472	422	419	441	495	580	715	905
7,000	538	572	509	447	431	454	513	602	749	953
7,500	561	598	530	461	438	461	524	615	769	981
8,000	584	626	551	476	446	469	535	638	790	1010
8,500	608	663	577	492	458	479	546	653	810	1038
9,000	633	701	604	507	473	493	559	668	831	1067
9,500	659	716	620	524	490	510	574	687	860	1111

Notice the conversion from minutes to hours. These values must be used because fuel flow is in lbs/hr.

f. The fuel flow for the three legs of the mission are calculated next. The heading on Table 2-1 shows a need for the Basic Fuel Flow data chart for the HUEY helicopter flying at 4000 ft and at 15°C ambient temperature. Table 2-3 contains the necessary information.

(1) Leg A-B is at 70 kts and 6,000 lbs. This is not one of the values given but 60 kts is 419 lb/hr and 80 kts is 441 lb/hr. Interpolation gives the value of 430 lb/hr for a 70 kts airspeed. Since the leg is one hour long:

Leg A-B = 1 X 430 = 430 lbs

(2) Leg B-C is at 40 kts and 9,000 lbs. This value is in the table; 507 lbs/hr. Since the leg is two hours long:

Leg B-C = 2 X 507 = 1014 lbs

(3) Leg C-A is at 70 kts and 6,000 lbs. This fuel flow rate was computed above to be 430 lbs/hr. Since the leg is two hours long:

Leg C-A = 2 X 430 = 860 lbs.

g. The flight profile can be finished by filling in Table 2-1 as shown in Table 2-4.

TABLE 2-4

Helicopter: HUEY
Altitude: 4000 ft flight/2000 ft Idle
Temperature: 15°C

LEG	DISTANCE	AS	TIME	GW (lbs)	FUEL
Idle @ A	-	-	10 min	-	52 lbs
A-B	70 N.M.	70 kts	1 hr	6,000	430 lbs
Idle @ B	-	-	20 min	-	103 lbs
B-C	80 N.M.	40 kts	2 hr	9,000	1014 lbs
Idle @ C	-	-	20 min	-	103 lbs
C-A	140 N.M.	70 kts	2 hr	6,000	860 lbs
Idle @ A	-	-	10 min	-	52 lbs
				TOTAL	2614 lbs

h. Although only two look-up tables were used for this example, each type of table has several conditions that are changed so that a wide band of performance parameters can be addressed. The discussion on each of the five types of tables is contained in Chapter 3. A succinct description of each of these five types of tables is:

(1) Basic Fuel Flow Data: Gives the rate the aircraft uses fuel dependent on the given flight conditions.

(2) Delta Fuel Flow for Drag Data: Gives the additional rate of fuel flow to be added to tne basic rate for external drag.

(3) Ground Idle Fuel Flow Data: Gives the rate fuel is used when the aircraft is on the ground with its engine running.

(4) Gross Weight Limits Data: A check on whether or not the aircraft has enough lift to take off with a given weight.

(5) Velocity Limits Data: Gives the optimum (long range) speed and maximum rates of speed.

CHAPTER 3

PERFORMANCE DATA TABLE DESCRIPTIONS

1. GENERAL

This chapter describes each of the five basic type tables used for developing flight profiles. The variables within each type of table are described as well as how the specific data required can be extracted.

2. BASIC FUEL FLOW DATA

a. The basic rate of fuel flow* is determined by five variables:

(1) Type of aircraft

(2) Altitude (Air Pressure)**

(3) Temperature***

(4) Gross Weight****

(5) Flight Mode

b. In each table (see Table 3-1) within the basic type, the first three variables are held constant for the whole table, i.e., (a) Type of Aircraft, (b) Altitude (Air Pressure) above sea level, and (c) Temperature. These variables are stated at the top of each table.

c. There are eight rows of fixed gross weights: 5,000 lbs, 6,000 lbs, 7,000 lbs, 7,500 lbs, 8,000 lbs, 8,500 lbs, 9,000 lbs and 9,500 lbs. The ten columns are fixed flight modes.

(1) The first column is Hover In Ground Effect (HIGE). HIGE is used for hovers at a height of 2 feet or less and a component of forward flight 10 kts or less.

(2) The second column is Hover Out of Ground Effect (HOGE). This is used for hovers at a height of more than 2 feet.

---

*The basic fuel flow data represents a clean drag configuration with all doors closed, no wing stores, and no external sling loads.

**All altitudes or air pressures are feet above sea level.

***For simplicity, all temperatures are considered to be the average temperature in which the helicopter is operating (Degrees Centigrade).

****Total vehicle weight in pounds.

(3) The third column is Nap of the Earth (NOE). This is defined as all flight for variable speeds from 0 to 40 kts and variable altitudes.

(4) The remaining seven columns are for given airspeeds* (in kts) as the flight mode.

d. There are 24 of these basic fuel flow charts. Each chart is for a different combination of Air Pressure (Altitude) and temperature.

e. The Basic Fuel Flow Data is the main table used in simulating a flight profile. For example, assume a pilot's flight path will require 30 minutes of flight at 80 kts airspeed, 4000 ft. altitude, 15°C and a gross weight of 8,000 lbs in a UH-1H helicopter. Using Table 3-1 at a gross weight of 8,000 lbs and an airspeed of 80 kts, the helicopter will use 469 lbs/hr fuel, i.e., for 30 minutes, 235 lbs of fuel will be used.

f. The gross weight values selected provide the basic range of load carrying capability for the ten flight modes of the HUEY helicopter. Within the gross weight band shown, linear interpolation** is quite accurate for estimating the fuel flow rates.

g. For example, using Table 3-1, if the helicopter's gross weight was 6,500 lbs and if the flight mode was 60 kts, the fuel flow cannot be found directly. But by interpolating between 60 kts, 6,000 lbs - 419 lbs/hr and 7,000 lbs - 431 lbs/hr, the basic fuel flow rate for 6,500 lbs is 425 lbs/hr. In this example, if the helicopter flies in this mode for 30 minutes, 213 lbs of fuel will be used.

h. As altitude and/or temperature changes occur, different tables are used to look up the aircraft's basic fuel flow rate for each leg of the flight path. Care must be taken that the proper table is used.

i. Appendix A contains a set of functions that will give a good approximation of the basic rate of fuel flow.

3. DELTA FUEL FLOW FOR DRAG DATA

a. The delta fuel flow for drag is also determined by five variables:

(1) Type of Aircraft

(2) Altitude (Air Pressure)

(3) Temperature

(4) Drag Surface (Equivalent Square Footage)

(5) Air Speed

All references to airspeeds are to true airspeeds.

**All references to interpolation are linear interpolations. See FPPH, Volume I, Chapter 3 for a discussion on the accuracy of interpolation.*

TABLE 3-1

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
6,000	459	476	439	402	403	425	481	565	682	872
6,000	497	521	472	422	419	441	495	580	715	905
7,000	538	572	509	447	431	454	513	602	749	953
7,500	561	598	530	461	438	461	524	615	769	981
8,000	584	626	551	476	446	469	535	638	790	1010
8,500	608	663	577	492	458	479	546	653	810	1038
9,000	633	701	604	507	473	493	559	668	831	1067
9,500	659	716	620	524	490	510	574	687	860	1111

TABLE 3-2

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	4	9	17	31	55	95
	15	3	11	27	53	98	175	295
	25	6	19	44	89	168	301	495
	35	8	26	62	125	239	436	695
	45	10	34	79	163	316	569	894
	55	12	41	97	203	394	703	1094

b. Like the basic fuel flow tables, there are 24 tables for delta fuel flow for drag.

c. There are six fixed rows of equivalent square feet of drag: 5, 15, 25, 35, 45, and 55 equivalent sq ft.

d. The seven columns are for airspeeds in kts of: 40 kts, 60 kts, 80 kts, 100 kts, 120 kts, 140 kts, and 160 kts.

e. When an external load is placed on the helicopter, the amount of fuel consumed per hour increases. The delta fuel flow for drag tables indicate how much extra fuel consumption to add to the basic fuel flow rate.

f. In the example given earlier, a 30 minute flight at 80 kts airspeed, 4000 ft altitude, 15°C and a gross weight of 8,000 lbs was used. Using the basic fuel flow tables, the basic fuel flow rate was 469 lbs/hr. Assuming for this new example that part of the load is external and inducing a 35 equivalent sq ft external drag, the delta fuel flow for drag (Table 3-2) shows 62 lbs/hr should be added to the basic fuel flow rate. Thus the basic fuel flow rate becomes 469 + 62 or 531 lbs per hour and for a half-hour flight, 266 lbs of fuel will be used instead of the 235 lbs figured without an external load.

g. Appendix B contains a function that will give a good approximation of the delta fuel flow for drag.

4. GROUND IDLE FUEL FLOW DATA

a. The ground idle fuel flow rate is determined by only three variables:

(1) Type of Aircraft

(2) Altitude (Air Pressure)

(3) Temperature

b. There is only one ground idle fuel flow table (shown as Table 2-2). The table has four rows of temperatures: -25°C, -5°C, 15°C and 35°C, and six columns of altitudes: Sea Level, 2000 ft, 4000 ft., 6000 ft., 8000 ft., and 10000 ft.

c. The ground idle fuel flow table is used as discussed in the example flight profile in Chapter 2 (Table 2-2). The UH-1H helicopter idling for 20 minutes at 2000 ft. altitude and 15°C, (across the row labeled 15°C and down the column labeled 2000) find the intersection at 309. Thus, the UH-1H uses 309 lbs/hr at these conditions and since it is idling for 20 minutes or 1/3 of an hour, it will use 103 lbs of fuel.

d. If the helicopter had only been 1000 ft. above sea level, the consumption rate would be found by interpolating between the sea level rate of 326 lbs/hr and the 2000 ft. rate of 309 lbs/hr which would be 317 lbs/hr. In 1/3 of an hour 106 lbs of fuel would be used.

e. Appendix C contains a function that will give a good approximation of the ground idle fuel flow.

5. GROSS WEIGHT LIMITS DATA

a. Gross weight limits tables are intended to show whether or not the aircraft can safely take off for four sets of criteria. These criteria are defined in the following paragraphs:

(1) Criteria #1 is based on the helicopter using 100% of Maximum Power for take off and having enough power to lift straight up and above ground effect (See Figure 3-1). Once it is in hovering above ground effect level, the helicopter begins forward flight until it acquires transitional lift and is able to climb at 450 ft/min (a desired standard rate of climb) to the desired altitude. This criteria has some risk since the pilot has no reserve power. It has less risk than Criteria #3 but more than Criteria #2 thus it is considered to be "Middle of the Road" risk.

(2) Criteria #2 (Figure 3-1) is based on the helicopter using 95% of Maximum Power for take off and enough power to immediately begin to climb at a rate of 450 ft/min. This is the least risky criteria since the pilot has power in reserve and is still able to climb at a satisfactory rate.

(3) Criteria #3 (Figure 3-1) has the most risk. Using 100% of Maximum Power the helicopter will only hover in ground effect. Therefore, at an altitude of 2 feet or less, the pilot must begin forward flight and gradually increase airspeed to acquire transitional lift to climb. The reasons for its high risk are readily apparent. First, there is no power in reserve. Second, the pilot must begin forward flight at a very low altitude.

(4) Criteria #4. Structural Gross Weight Limits is the total upper limit of gross weight the helicopter can carry under any take off criteria.

b. Gross Weight Limits are determined by four variables:

(1) Type of Aircraft

(2) Criteria Chosen

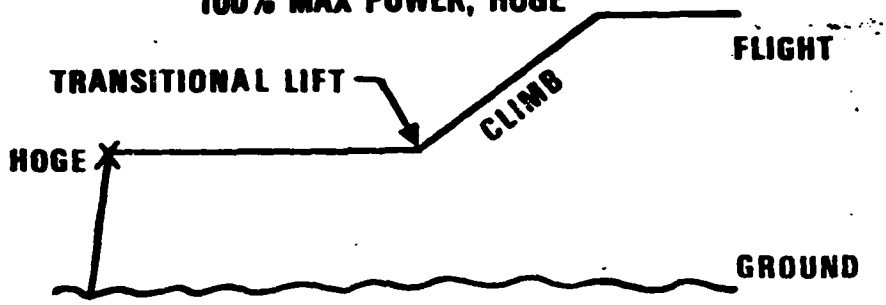
(3) Altitude (Air Pressure)

(4) Temperature

CRITERIA #1

(MIDDLE OF THE ROAD)

100% MAX POWER, HOGE

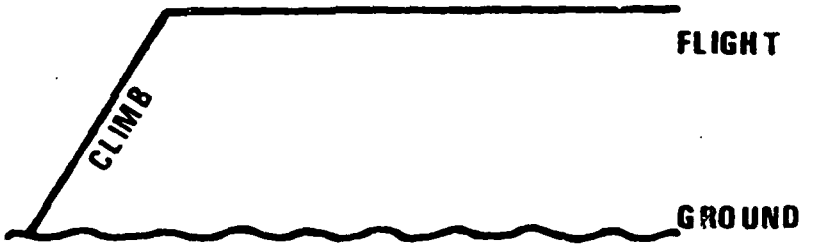


NOTHING TO SPARE.

CRITERIA #2

(LEAST RISKY)

95% OF RATED POWER. VERTICAL RATE OF CLIMB 450 FT/MIN. HOGE

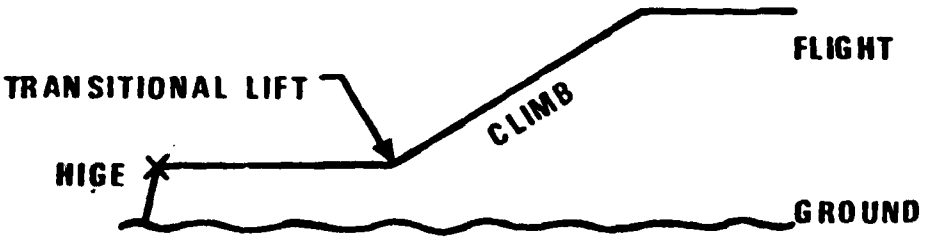


POWER LEFT

CRITERIA #3

(MOST RISKY)

100% MAX POWER, HIGE



NOTHING TO SPARE.

FIGURE 3-1

c. Additionally, Criteria #1, #2, and #3 differ due to engine power limits or transmission power limits of the aircraft. Thus there are six tables:

(1) Criteria #1 (Due to engine)

(2) Criteria #1 (Due to transmission)

(3) Criteria #2 (Due to engine)

(4) Criteria #2 (Due to transmission)

(5) Criteria #3 (Due to engine)

(6) Criteria #3 (Due to transmission)

d. The structural gross weight limit is a single value for each helicopter and is only dependent on the type helicopter. The HUEY structural gross weight limit is given as 9,500 lbs and is listed at the bottom of each table. As the name implies, it is simply not safe to expect the UH-1H structure to maneuver normally when the total weight is larger than that value.

e. In simulating inflight profile, the gross weight limits tables are used to check whether the aircraft is going to be too heavy to take off under the given conditions. As an example, assume a HUEY pilot planned a mission that called for using take off criteria #1 and the take off was to be at 6000 ft., 15°C, and a gross weight of 8,800 Three checks would be required: First, does this gross weight exceed the structural gross weight limit? Second, does it exceed Criteria #1 (due to transmission)? Third, does it exceed Criteria #1 (due to engine)? In the example given, the answer to all three questions is "No", the take off will not exceed aircraft limits. (Tables 3-3 and 3-4)

f. If the assigned gross weight had been 9,000 lbs, it would have exceeded the value given for 6,000 ft. and 15°C at Criteria #1 (Due to engine). (Table 3-3) The mission could not be flown as planned. The plan could be changed, for example to take off at 4000 ft. (which might not be practical) or change to take off Criteria #3 (which is more risky but has higher limits).

g. If the assigned gross weight had been 9,700 lbs., it would have exceeded the structural limits. To perform the mission the only choices would be to lighten the load or get another type helicopter.

h. Appendix D contains a set of functions that will give a good approximation of the gross weight limits for takeoff.

TABLE 3-3

GROSS WEIGHT LIMITS
(DUE TO ENGINE)
FOR TAKEOFF CRITERIA #1
100% OF MAXIMUM POWER (HOGE)
AIRCRAFT - UH-1H
HUEY

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	13412	12622	11705	10878	10095	9348
	-5 C	12459	11357	10808	10038	9294	8594
	15 C	11154	10367	9557	8854	8158	7537
	35 C	9296	8618	7982	7386	6831	6285

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 9500 LBS

TABLE 3-4

GROSS WEIGHT LIMITS
(DUE TO TRANSMISSION)
FOR TAKEOFF CRITERIA #1
100% OF MAXIMUM POWER (HOGE)
AIRCRAFT - UH-1H
HUEY

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	+25 C	10117	9945	9742	9523	9352	9161
	+5 C	10001	9796	9584	9430	9211	8658
	15 C	9825	9618	9470	9252	8701	8377
	35 C	9643	9494	9297	8773	8394	8468

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 9500 LBS

6. VELOCITY LIMITS DATA

a. There are various types of data given in these tables but like the gross weight limits tables, they are primarily restraints on what can be expected of a helicopter in planning a mission profile. Velocity limits tables are influenced by five variables:

(1) Type of aircraft

(2) Air pressure (altitude)

(3) Temperature

(4) Gross weight

(5) Condition or limit

b. Items (1) through (4) are self-explanatory. There are five types of information that can be listed under (5):

(1) Long range

(2) Maximum continuous power

(3) Maximum power (due to engine limits)

(4) Transmission limits

(5) V_{ne} (velocity never exceed)

c. For each aircraft, there are 24 Velocity Limits Tables depending on air pressure and temperature combination. Table 3-3 is an example of the content of the Velocity Limits Table.

d. The two columns under Long Range (Table 3-5) give the optimum speed and fuel flow for each set of variables #1 through #4 above. Thus the HUEY helicopter operating at 2000 ft., temperature 15°C, and having a gross weight of 8,000 lbs will fly a longer distance if the velocity is kept at 123 kts and will use 686 lbs/hr of fuel at that velocity.

e. Maximum continuous power gives the fastest speed at which a helicopter can fly for long periods (30 minutes or more) and the associated fuel flow rate. An example from Table 3-5 would be a HUEY helicopter at 2000 ft. and 15°C weighing 8,000 lbs could fly 129 kts with a fuel usage of 730 lbs/hr.

TABLE 3-5

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: 15 C

AIRCRAFT = UH-1H

HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	129	658	140	730	147	796	142	744	123	620
6,000	130	676	137	730	144	796	139	744	123	632
7,000	130	697	134	730	141	796	136	744	123	650
7,500	124	675	131	730	139	796	133	744	123	666
8,000	123	686	129	730	137	796	131	744	120	663
8,500	123	697	127	730	134	796	129	744	118	660
9,000	118	683	124	730	132	796	126	744	115	666
9,500	117	691	122	730	130	796	124	744	113	662

f. Maximum power (engine and transmission limits) show the maximum speeds the aircraft can structurally attain for short periods of time (less than 30 minutes). Thus the HUEY helicopter at 2000 ft and 15°C weighing 8,000 lbs has an engine that is capable of producing enough power to fly 137 kts but the transmission limits the aircraft to 131 kts. Between these two columns then, the flight cannot exceed 131 kts with a fuel flow rate of 744 lbs/hr.

g. There is another limiting factor called V_{ne} (velocity never exceed). This velocity limit is determined by helicopter structural considerations. Vne's function like maximum power limits, that is, it lists velocities that the HUEY cannot exceed for the given conditions. Since a value of 120 kts is listed for 2,000 ft., 15°C, and 8,000 lbs, this implies that none of the values in d, e, or f can be reached.

7. DETAILED FLIGHT PROFILE USING ALL PERFORMANCE DATA TABLES

The example of a Flight Profile in Chapter 2 was intentionally simplified to assure clarity. The description of the various tables in this handbook, however, indicates a more complex set of considerations are normally encountered in developing the flight profile. With the description provided in this chapter, additional information should be included in the flight plan beyond that shown in the example and a suggested format is provided below in Table 3-6.

TABLE 3-6

Helicopter:
Altitude:
Temperature:

LEG	DISTANCE	AS	CHECK VELOCITY LIMIT	TIME	GW (LBS)	DRAG	FUEL

Needed for each take off:
Weight at take off:
Type of take off:
Check transmission limits:
Check engine limits:
Check structural gross weight limit:

CHAPTER 4

HUEY PERFORMANCE DATA TABLES

GENERAL

The following tables are the major information presented in this handbook. If the procedure for using them is understood, a flight profile for the HUEY helicopter can be prepared in a matter of a few hours. The performance data contained have been reviewed for accuracy and are corrected to the best of our knowledge. The tables are organized in the following manner:

Tables 4-1 to 4-24	Basic Fuel Flow Data
Tables 4-25 to 4-48	Delta Fuel Flow for Drag Data
Table 4-49	Ground Idle Fuel Flow Data
Tables 4-50 to 4-55	Gross Weight Limits Data
Tables 4-56 to 4-79	Velocity Limits Data

BASIC FUEL FLOW DATA

TABLES

TABLE 4-1

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: SEA LEVEL TEMPERATURE: -25 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	480	497	472	448	462	508	609	807	1132	1635
6,000	516	535	500	465	479	525	628	847	1203	1734
7,000	553	580	532	485	499	546	666	892	1278	1843
7,500	572	603	550	496	509	556	682	917	1320	1901
8,000	592	627	568	508	517	567	699	946	1364	1964
8,600	612	653	587	521	526	577	718	977	1412	2031
9,000	634	680	608	535	535	587	740	1012	1465	2104
9,500	656	707	629	550	543	597	763	1050	1521	2181

TABLE 4-2

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: SEA LEVEL TEMPERATURE: -5 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	491	508	478	448	454	488	568	688	895	1205
6,000	528	548	506	465	470	504	583	704	929	1263
7,000	565	592	538	485	488	522	600	742	969	1324
7,500	585	616	556	496	496	531	609	757	993	1360
8,000	606	641	575	508	504	539	619	775	1021	1400
8,500	626	668	595	522	511	546	631	796	1052	1445
9,000	649	694	615	536	518	554	643	820	1085	1493
9,500	672	721	636	551	526	562	656	844	1120	1543

TABLE 4-3

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: SEA LEVEL TEMPERATURE: 15 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	502	519	486	453	455	480	547	645	779	989
6,000	540	561	515	470	470	495	560	658	793	1016
7,000	578	606	548	490	485	511	575	673	829	1050
7,500	598	631	566	502	492	518	583	683	845	1072
8,000	619	657	586	515	498	525	592	695	863	1097
8,500	641	683	606	529	504	531	602	708	883	1126
9,000	664	710	627	544	512	538	613	721	904	1154
9,500	687	741	650	559	522	547	625	746	924	1183

TABLE 4-4

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: SEA LEVEL TEMPERATURE: 35 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	513	530	495	459	459	480	536	621	733	883
6,000	551	573	525	477	474	494	548	631	743	895
7,000	591	621	560	499	487	507	562	645	759	914
7,500	611	646	578	511	493	512	570	655	770	928
8,000	633	671	598	525	498	518	579	666	783	943
8,500	656	698	619	539	505	525	589	677	796	959
9,000	679	731	643	554	515	533	599	688	809	973
9,500	703	769	669	569	528	545	609	697	821	986

TABLE 4-5

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: -25 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
6,000	459	475	449	422	435	478	573	764	1076	1554
6,500	495	515	478	441	454	497	604	806	1151	1657
7,000	533	562	512	462	473	518	635	854	1229	1771
7,500	553	587	530	474	482	529	652	883	1274	1834
8,000	573	612	550	487	491	539	672	915	1323	1902
8,500	595	639	570	501	499	548	694	951	1376	1976
9,000	617	667	592	517	508	558	718	990	1433	2055
9,500	641	696	615	533	517	578	744	1031	1493	2136

TABLE 4-6

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: -5 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	469	486	454	422	428	459	533	645	844	1140
6,000	506	528	484	440	445	476	549	676	879	1198
7,000	545	574	518	462	462	494	567	705	925	1267
7,500	565	600	537	474	469	502	577	723	953	1307
8,000	587	626	557	488	476	509	589	745	984	1353
8,500	609	652	577	502	483	517	601	768	1018	1401
9,000	632	680	599	518	492	525	614	793	1054	1462
9,500	656	714	624	533	502	536	643	817	1092	1502

TABLE 4-7

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: 15 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	480	497	462	426	428	452	513	604	729	929
6,000	518	540	492	445	444	467	526	617	758	958
7,000	557	588	528	467	458	482	542	636	786	998
7,500	578	614	547	480	464	488	552	647	805	1024
8,000	600	640	567	495	470	495	562	661	825	1052
8,500	623	667	588	509	478	503	573	674	846	1081
9,000	647	702	613	525	489	513	585	698	866	1109
9,500	672	742	641	540	503	526	597	713	887	1137

TABLE 4-8

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 2000 FT TEMPERATURE: 35 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	490	508	470	433	432	451	502	580	685	825
6,000	529	553	502	452	446	465	515	592	697	839
7,000	570	602	539	476	458	477	530	609	717	863
7,500	591	627	559	490	464	482	539	620	729	879
8,000	614	655	580	504	471	489	549	632	743	894
8,500	639	690	604	519	482	499	559	642	755	908
9,000	662	726	630	534	496	511	570	652	768	921
9,500	687	743	647	550	512	527	583	665	786	944

TABLE 4-9

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: -25 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	439	455	427	398	410	450	539	724	1025	1479
6,000	476	498	458	418	430	470	573	768	1100	1586
7,000	515	546	494	441	448	492	607	822	1186	1708
7,500	535	573	513	454	457	502	627	855	1236	1777
8,000	557	600	534	469	465	511	649	891	1290	1852
8,500	580	628	556	484	474	521	674	931	1348	1931
9,000	603	658	579	501	483	542	701	974	1409	2014
9,500	628	694	606	518	495	559	728	1019	1471	2097

TABLE 4-10

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: -5 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	449	466	432	398	403	432	500	605	796	1079
6,000	487	509	463	417	420	450	517	639	836	1141
7,000	526	559	500	441	436	467	537	673	887	1217
7,500	548	585	520	455	443	474	548	695	918	1263
8,000	571	612	541	470	451	482	561	719	953	1312
8,500	594	640	563	486	460	491	586	743	990	1363
9,000	618	677	589	501	471	502	603	767	1028	1413
9,500	643	720	619	518	486	517	622	791	1068	1463

TABLE 4-11

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	459	476	439	402	403	425	481	565	682	872
6,000	497	521	472	422	419	441	495	580	715	905
7,000	538	572	509	447	431	454	513	602	749	953
7,500	561	598	530	461	438	461	524	615	769	981
8,000	584	626	551	476	446	469	535	638	790	1010
8,500	608	663	577	492	458	479	546	653	810	1038
9,000	633	701	604	507	473	493	559	668	831	1067
9,500	659	716	620	524	490	510	574	687	860	1111

TABLE 4-12

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 4000 FT TEMPERATURE: 35 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	469	487	448	408	407	424	471	542	639	770
6,000	508	534	482	429	420	437	484	556	654	788
7,000	551	584	520	456	431	448	502	577	678	817
7,500	573	613	542	470	439	455	511	588	692	833
8,000	597	649	567	485	450	466	522	598	704	846
8,500	622	682	591	501	465	479	533	609	718	860
9,000	648	696	607	517	482	495	546	624	739	889
9,500	675	779	657	535	500	512	564	649	774	944

TABLE 4-13

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: -25 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	420	437	407	376	388	425	515	687	978	1410
6,000	458	483	440	397	407	446	546	734	1056	1522
7,000	499	533	478	423	425	466	583	796	1151	1654
7,500	520	561	499	437	433	476	606	833	1206	1730
8,000	543	589	521	453	442	486	631	873	1264	1810
8,500	567	620	545	470	452	508	658	917	1325	1893
9,000	592	659	573	487	465	526	686	963	1388	1977
9,500	620	702	604	506	482	548	716	1008	1452	2062

TABLE 4-14

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: -5 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	430	447	412	376	380	407	470	578	751	1023
6,000	468	493	445	397	397	425	488	606	795	1089
7,000	510	545	484	423	412	440	510	647	855	1176
7,500	533	572	505	438	419	448	523	671	889	1225
8,000	556	602	528	454	429	458	548	695	927	1276
8,500	581	642	556	473	441	470	565	718	966	1325
9,000	607	681	584	487	457	486	585	743	1007	1377
9,500	635	696	600	505	476	505	607	775	1056	1443

TABLE 4-15

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: 15 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	440	458	419	380	380	400	451	529	649	820
6,000	479	505	453	402	394	415	467	547	677	858
7,000	522	557	493	429	407	428	487	572	715	912
7,500	545	586	515	444	415	436	498	594	736	941
8,000	569	625	542	460	428	448	510	609	756	969
8,500	595	657	566	476	444	462	523	625	779	1001
9,000	622	674	583	493	462	479	539	648	812	1053
9,500	651	773	643	512	480	498	560	684	863	1130

TABLE 4-16

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 6000 FT TEMPERATURE: 35 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	449	468	427	386	382	398	441	507	598	720
6,000	489	517	463	409	394	410	456	524	617	743
7,000	534	571	504	438	408	423	475	547	643	774
7,500	558	608	530	453	420	434	486	557	655	787
8,000	583	637	552	468	435	448	497	568	670	803
8,500	609	667	571	485	453	464	512	585	694	839
9,000	637	767	636	504	470	482	532	615	734	899
9,500	668	799	664	529	490	505	560	651	777	932

TABLE 4-17

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: -25 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	403	421	389	356	366	401	488	653	933	1346
6,000	442	469	424	379	385	422	521	706	1018	1466
7,000	485	522	465	407	402	442	564	776	1123	1611
7,500	507	551	487	423	411	459	590	816	1182	1692
8,000	532	584	512	440	422	475	617	861	1244	1775
8,500	557	625	541	457	436	494	645	907	1306	1859
9,000	585	664	570	475	454	518	676	953	1372	1946
9,500	614	682	588	495	475	546	713	1007	1447	2049

TABLE 4-18

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: -5 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	412	431	393	356	359	384	442	545	711	970
6,000	452	479	429	379	375	401	461	578	761	1045
7,000	496	532	470	408	389	416	486	624	828	1140
7,500	520	564	493	423	399	426	510	648	865	1191
8,000	544	606	522	439	413	439	528	672	905	1240
8,500	571	638	547	456	429	456	549	698	949	1295
9,000	600	656	566	475	449	475	573	734	1002	1371
9,500	631	768	632	497	469	497	605	785	1074	1475

TABLE 4-19

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: 15 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	422	441	400	359	358	376	424	496	610	772
6,000	462	491	437	384	371	390	441	517	643	818
7,000	508	547	480	413	386	405	463	552	684	875
7,500	532	586	507	429	399	417	475	567	704	903
8,000	558	612	529	445	415	432	488	584	729	938
8,500	585	643	553	463	434	450	505	610	767	997
9,000	616	757	620	484	453	470	528	651	822	1079
9,500	648	779	644	510	474	496	570	697	882	1120

TABLE 4-20

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 8000 FT TEMPERATURE: 35 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	431	451	408	366	359	374	414	475	560	674
6,000	473	501	446	391	371	385	431	496	583	702
7,000	519	567	494	421	390	403	451	517	608	730
7,500	544	592	514	437	406	418	463	528	624	749
8,000	571	627	541	454	424	434	479	549	652	791
8,500	600	731	603	475	442	453	501	581	694	850
9,000	632	741	621	501	463	479	534	621	740	868
9,500	674	788	662	536	493	520	596	714	875	1085

TABLE 4-21

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: -25 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	387	407	372	338	347	379	464	622	894	1288
6,000	428	457	410	363	364	400	500	683	987	1419
7,000	472	513	453	393	382	427	549	761	1101	1576
7,500	497	547	479	410	393	443	576	806	1163	1659
8,000	523	590	509	428	408	463	605	851	1226	1743
8,500	552	623	535	446	427	488	638	899	1294	1834
9,000	581	644	555	467	449	518	678	958	1375	1947
9,500	611	762	626	490	472	552	724	1032	1475	2090

TABLE 4-22

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: -5 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	396	416	377	337	338	362	416	516	675	924
6,000	438	467	415	363	353	378	437	555	733	1008
7,000	484	526	460	394	371	396	475	603	806	1108
7,500	509	568	489	410	385	409	493	626	845	1158
8,000	536	593	510	427	402	427	514	654	890	1216
8,500	566	630	539	447	422	447	540	695	950	1302
9,000	597	749	609	470	443	470	575	752	1028	1407
9,500	629	766	632	498	467	509	622	818	1110	1470

TABLE 4-23

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: 15 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	405	426	383	341	336	354	398	466	576	730
6,000	448	477	423	368	349	367	417	491	614	782
7,000	495	547	473	399	371	388	441	526	654	839
7,500	521	569	492	415	388	403	455	544	680	877
8,000	550	622	528	433	406	421	473	574	723	944
8,500	580	717	586	456	426	443	499	618	781	1020
9,000	615	724	604	485	449	473	548	670	850	1059
9,500	658	785	654	523	483	519	628	800	1048	1388

TABLE 4-24

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR

PRESSURE: 10000 FT TEMPERATURE: 35 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	FLIGHT MODE (KTS)									
	HIGE	HOGE	NOE	40	60	80	100	120	140	160
5,000	414	436	392	347	337	351	389	447	526	633
6,000	458	490	432	375	350	363	408	469	551	664
7,000	507	549	477	406	378	389	430	491	580	696
7,500	534	603	513	424	396	405	447	513	611	744
8,000	563	684	565	446	414	426	471	547	654	796
8,500	599	692	584	475	437	456	511	597	712	830
9,000	644	761	637	513	473	504	593	737	939	1268
9,500	700	838	700	562	526	574	732	1040	1422	2345

DELTA FUEL FLOW FOR DRAG DATA

TABLES

TABLE 4-25

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: SEA LEVEL TEMPERATURE: -25 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	5	12	25	50	90	134
	15	4	15	36	76	155	270	403
	25	7	25	60	131	265	450	671
	35	10	35	85	185	379	629	939
	45	13	45	110	241	492	809	1208
	55	16	55	135	300	606	989	1476

TABLE 4-26

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: SEA LEVEL TEMPERATURE: -5 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET.	5	1	5	11	22	42	77	124
	15	4	14	33	67	130	237	373
	25	7	23	55	112	219	404	621
	35	10	33	77	159	316	570	869
	45	12	42	99	209	415	736	1118
	55	15	51	122	260	521	903	1366

TABLE 4-27

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: SEA LEVEL TEMPERATURE: 15 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	4	10	20	36	65	107
	15	4	13	31	60	111	199	338
	25	6	22	51	102	192	343	569
	35	9	30	72	144	273	500	800
	45	12	39	92	187	359	652	1031
	55	14	48	113	232	450	807	1262

TABLE 4-28

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: SEA LEVEL TEMPERATURE: 35 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	4	10	19	33	56	90
	15	4	12	29	56	101	177	289
	25	6	20	48	94	171	302	505
	35	8	28	67	132	247	436	721
	45	11	36	86	172	323	581	937
	55	13	44	105	211	402	725	1153

TABLE 4-29

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: -25 C

AIRCRAFT - UH-1H

HUEY

DRAG IN SQUARE FEET	AIR SPEED IN KTS						
	40	60	80	100	120	140	160
5	1	5	11	23	48	84	125
15	4	14	34	72	146	251	374
25	7	23	56	124	251	418	624
35	10	32	80	174	356	585	873
45	12	42	103	227	461	752	1123
55	15	51	126	283	567	919	1372

TABLE 4-30

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: -5 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	4	10	21	40	72	115
	15	4	13	31	62	121	223	346
	25	6	22	51	105	206	377	577
	35	9	30	72	149	296	532	808
	45	12	39	93	196	389	687	1039
	55	14	47	114	243	490	842	1270

TABLE 4-31

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: 15 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	4	10	19	34	60	100
	15	4	12	29	56	104	186	316
	25	6	20	48	95	180	321	531
	35	8	28	66	134	255	465	745
	45	11	36	86	174	337	609	960
	55	13	44	105	217	421	763	1175

TABLE 4-32

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: 35 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET.	5	1	4	9	17	31	53	85
	15	3	11	27	52	94	165	271
	25	6	19	45	87	160	283	472
	35	8	26	62	123	231	408	673
	45	10	34	80	160	302	544	874
	55	12	41	98	197	377	678	1075

TABLE 4-33

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: -25 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	4	10	22	45	78	116
	15	4	13	31	69	137	233	348
	25	6	22	53	116	237	388	579
	35	9	30	74	163	334	543	811
	45	11	39	96	214	431	699	1043
	55	14	48	118	267	529	854	1275

TABLE 4-34

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: -5 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	4	9	19	38	67	107
	15	4	12	28	58	113	210	322
	25	6	20	47	98	194	353	536
	35	8	28	67	140	278	496	751
	45	11	36	86	184	366	640	965
	55	13	44	106	227	457	784	1180

TABLE 4-35

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	4	9	17	31	55	95
	15	3	11	27	53	98	175	295
	25	6	19	44	89	168	301	495
	35	8	26	62	125	239	436	695
	45	10	34	79	163	316	569	894
	55	12	41	97	203	394	703	1094

TABLE 4-36

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 4000 FT TEMPERATURE: 35 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	3	8	16	29	50	80
	15	3	10	25	48	88	154	255
	25	5	17	41	81	150	266	442
	35	7	24	58	115	217	383	629
	45	9	31	74	149	282	510	815
	55	11	38	91	184	353	633	1002

TABLE 4-37

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 6000 FT TEMPERATURE: -25 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	4	10	21	42	72	108
	15	4	12	29	66	130	216	323
	25	6	20	49	109	221	360	538
	35	8	28	70	154	312	504	753
	45	11	36	90	202	403	648	968
	55	13	44	111	251	493	792	1183

TABLE 4-38

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 6000 FT TEMPERATURE: -5 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	4	9	18	35	63	99
	15	3	11	26	54	105	197	298
	25	5	19	44	92	182	330	497
	35	8	26	62	131	260	463	696
	45	10	33	81	172	345	596	895
	55	12	41	99	212	428	730	1094

TABLE 4-39

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 6000 FT TEMPERATURE: 15 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	3	8	16	29	52	91
	15	3	10	25	49	92	164	276
	25	5	17	41	83	158	284	461
	35	7	24	57	117	224	408	647
	45	9	31	74	153	296	532	832
	55	11	38	91	190	369	656	1017

TABLE 4-40

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG
PRESSURE: 6000 FT TEMPERATURE: 35 C
AIRCRAFT - UH-1H
HUEY

DRAG IN SQUARE FEET	AIR SPEED IN KTS						
	40	60	80	100	120	140	160
5	1	3	8	15	27	48	76
15	3	10	23	45	82	144	239
25	5	16	38	76	141	249	413
35	7	23	54	107	202	359	587
45	9	29	69	139	264	475	760
55	11	36	84	172	330	591	933

TABLE 4-41

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: -25 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	4	9	20	40	67	100
	15	3	11	28	61	125	200	299
	25	6	19	46	102	208	334	498
	35	8	26	65	146	292	467	697
	45	10	34	84	191	376	601	897
	55	12	41	103	236	460	734	1096

TABLE 4-42

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: -5 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	3	8	17	32	61	92
	15	3	10	25	51	99	185	277
	25	5	17	41	86	171	308	461
	35	7	24	58	124	245	432	645
	45	9	31	75	161	325	555	830
	55	11	38	92	199	402	679	1014

TABLE 4-43

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: 15 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	3	8	15	28	49	86
	15	3	10	23	46	88	155	258
	25	5	16	38	77	148	268	429
	35	7	22	53	109	212	383	601
	45	9	29	69	143	279	498	772
	55	10	35	84	179	349	613	944

TABLE 4-44

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: 35 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	3	7	14	25	45	72
	15	3	9	21	42	77	135	225
	25	4	15	35	71	132	233	386
	35	6	21	50	100	189	336	546
	45	8	27	64	130	246	444	707
	55	10	33	78	161	309	551	867

TABLE 4-45

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG
PRESSURE: 10000 FT TEMPERATURE: -25 C
AIRCRAFT - UH-1H
HUEY

DRAG IN SQUARE FEET	AIR SPEED IN KTS						
	40	60	80	100	120	140	160
5	1	3	9	19	39	62	92
15	3	10	26	56	117	185	277
25	5	17	43	96	195	309	461
35	7	24	61	137	273	433	646
45	9	31	79	179	351	556	830
55	11	39	98	222	428	680	1015

TABLE 4-46

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 10000 FT TEMPERATURE: -5 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	3	8	16	30	58	85
	15	3	10	23	48	95	172	256
	25	5	16	38	83	162	287	427
	35	7	22	54	117	233	401	597
	45	9	29	70	152	305	515	768
	55	10	35	86	188	377	630	939

TABLE 4-47

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG
PRESSURE: 10000 FT TEMPERATURE: 15 C
AIRCRAFT - UH-1H
HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	3	7	14	27	47	80
	15	3	9	21	43	83	146	239
	25	4	15	35	72	139	253	398
	35	6	21	49	102	200	359	557
	45	8	27	64	135	262	465	716
	55	10	33	79	167	327	572	874

TABLE 4-48

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 10,00 FT TEMPERATURE: 35 C

AIRCRAFT - UH-1H

HUEY

		AIR SPEED IN KTS						
		40	60	80	100	120	140	160
DRAG IN SQUARE FEET	5	1	3	7	13	23	42	68
	15	2	8	20	39	72	126	212
	25	4	14	33	66	124	218	360
	35	6	19	46	93	176	315	509
	45	7	25	59	121	231	414	657
	55	9	30	73	151	289	514	806

GROUND IDLE FUEL FLOW DATA

TABLE

TABLE 4-49

GROUND IDLE FUEL FLOW

AIRCRAFT - UH-1H

HUEY

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	320	303	288	274	260	246
	-5 C	323	306	291	277	264	250
	15 C	326	309	294	280	268	254
	35 C	330	312	298	284	271	259

ENTRIES ARE AIRCRAFT FUEL FLOW RATES IN LBS/HR

GROSS WEIGHT LIMITS DATA

TABLES

TABLE 4-50

GROSS WEIGHT LIMITS
(DUE TO ENGINE)
FOR TAKEOFF CRITERIA #1
100% OF MAXIMUM POWER (HOGE)
AIRCRAFT - UH-1H
HUEY

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	13412	12622	11705	10878	10095	9348
	-5 C	12459	11357	10808	10038	9294	8594
	15 C	11154	10367	9557	8854	8158	7537
	35 C	9296	8618	7982	7386	6831	6285

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 9500 LBS

TABLE 4-51

GROSS WEIGHT LIMITS
(DUE TO TRANSMISSION)
FOR TAKEOFF CRITERIA #1
100% OF MAXIMUM POWER (HOGE)
AIRCRAFT - UH-1H
HUEY

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	10117	9945	9742	9523	9352	9161
	-5 C	10001	9796	9584	9430	9211	8658
	15 C	9825	9618	9470	9252	8701	8377
	35 C	9643	9494	9297	8773	8394	8468

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 9500 LBS

TABLE 4-52

GROSS WEIGHT LIMITS

(DUE TO ENGINE)

FOR TAKEOFF CRITERIA #2

95% OF RATED POWER. VERTICAL RATE OF CLIMB 450 FT/MIN. OGE

AIRCRAFT - UH-1H

HUEY

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	12289	11865	10919	10235	9594	8905
	-5 C	11443	10338	10002	9316	8604	7936
	15 C	10144	9428	8697	8058	7430	6867
	35 C	8486	7865	7281	6736	6228	5726

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 9500 LBS

TABLE 4-53

GROSS WEIGHT LIMITS
(DUE TO TRANSMISSION)
FOR TAKEOFF CRITERIA #2
TRANSMISSION POWER LIMIT. VERTICAL RATE OF CLIMB 450 FT/MIN. OGE
AIRCRAFT - UH-1H
HUEY

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	9530	9398	9245	9062	8865	8721
	-5 C	9449	9296	9112	8923	8791	8563
	15 C	9321	9140	8955	8828	8606	8075
	35 C	9163	8979	8851	8656	8144	7892

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 9500 LBS

TABLE 4-54

GROSS WEIGHT LIMITS
(DUE TO ENGINE)
FOR TAKEOFF CRITERIA #3
100% OF MAXIMUM POWER (HIGE)
AIRCRAFT - UH-1H
HUEY

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	15281	14608	13482	12598	11768	10914
	-5 C	14124	12807	12311	11456	10590	9776
	15 C	12536	11651	10745	9956	9178	8480
	35 C	10427	9663	8946	8276	7651	7034

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 9500 LBS

TABLE 4-55

GROSS WEIGHT LIMITS
(DUE TO TRANSMISSION)
FOR TAKEOFF CRITERIA #3
100% OF MAXIMUM POWER (HIGE)
AIRCRAFT - UH-1H
HUEY

		PRESSURE ALTITUDE (FT)					
		SEA LEVEL	2000	4000	6000	8000	10000
TEMPERATURE DEGREES CENTIGRADE	-25 C	11320	11179	11020	10842	10650	10420
	-5 C	11170	11012	10835	10646	10418	10101
	15 C	11014	10840	10654	10432	10125	9756
	35 C	10854	10672	10459	10165	9805	9422

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 9500 LBS

VELOCITY LIMITS DATA

TABLES

TABLE 4-56

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: -25 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	103	631	131	971	133	995	115	744	111	710
6,000	102	647	128	971	130	995	111	744	111	744
7,000	96	631	125	971	126	995	108	744	111	781
7,500	94	634	123	971	125	995	106	744	111	802
8,000	93	640	121	971	123	995	104	744	111	825
8,500	96	683	120	971	121	995	103	744	111	850
9,000	95	694	118	971	119	995	100	744	111	876
9,500	94	705	115	971	117	995	98	744	111	906

TABLE 4-57

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: °5 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	119	680	139	881	143	939	126	754	116	658
6,000	120	704	136	881	141	939	125	754	116	673
7,000	113	681	133	881	138	939	121	754	116	703
7,500	113	689	132	881	136	939	120	754	116	716
8,000	107	671	130	881	134	939	118	754	116	737
8,500	108	671	128	881	132	939	115	754	116	756
9,000	104	676	126	881	130	939	113	754	116	777
9,500	103	685	123	881	128	939	111	754	116	800

TABLE 4-58

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: 15 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER-EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	129	701	141	786	148	856	138	764	120	645
6,000	130	720	139	786	146	856	136	764	120	658
7,000	130	738	136	786	143	856	133	764	120	673
7,500	130	749	135	786	141	856	132	764	120	683
8,000	124	725	132	786	139	856	129	764	120	695
8,500	123	735	130	786	137	856	127	764	120	708
9,000	123	746	128	786	135	856	125	764	119	713
9,500	118	732	125	786	133	856	122	764	116	719

TABLE 4-59

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: 35 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	138	722	134	694	143	750	146	774	123	635
6,000	139	736	132	694	141	750	145	774	123	645
7,000	140	758	129	694	139	750	142	774	123	660
7,500	140	771	127	694	137	750	141	774	123	670
8,000	140	785	125	694	135	750	139	774	121	669
8,500	140	798	123	694	133	750	137	774	118	668
9,000	140	809	121	694	131	750	135	774	116	666
9,500	139	813	119	694	129	750	133	774	113	664

TABLE 4-60

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: -25 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
6,000	102	592	131	911	134	962	117	728	115	714
6,000	98	588	127	911	130	962	113	728	115	752
7,000	94	590	124	911	127	962	110	728	115	795
7,500	96	626	122	911	125	962	108	728	115	820
8,000	96	637	120	911	123	962	106	728	115	848
8,500	95	648	117	911	121	962	103	728	115	880
9,000	93	658	115	911	118	962	101	728	115	916
9,500	93	676	113	911	116	962	99	728	115	953

TABLE 4-61

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 2000 FT TEMPERATURE: -5 C
AIRCRAFT - UH-1H
HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	119	640	138	823	140	848	130	736	120	646
6,000	113	626	135	823	137	848	127	736	120	676
7,000	112	641	132	823	134	848	123	736	120	706
7,500	107	623	130	823	132	848	121	736	120	724
8,000	105	625	128	823	130	848	119	736	120	745
8,500	104	631	125	823	128	848	117	736	120	769
9,000	103	640	123	823	125	848	114	736	119	780
9,500	104	677	121	823	123	848	112	736	116	779

TABLE 4-62

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: 15 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	129	658	140	730	147	796	142	744	123	620
6,000	130	676	137	730	144	796	139	744	123	632
7,000	130	697	134	730	141	796	136	744	123	650
7,500	124	675	131	730	139	796	133	744	123	666
8,000	123	686	129	730	137	796	131	744	120	663
8,500	123	697	127	730	134	796	129	744	118	660
9,000	118	683	124	730	132	796	126	744	115	666
9,500	117	691	122	730	130	796	124	744	113	662

TABLE 4-63

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: 35 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	138	676	133	644	142	696	151	753	120	579
6,000	139	692	131	644	140	696	149	753	120	590
7,000	140	718	127	644	137	696	146	753	120	608
7,500	140	732	125	644	134	696	144	753	120	619
8,000	140	745	122	644	132	696	142	753	117	618
8,500	140	753	120	644	131	696	140	753	115	617
9,000	138	767	122	644	127	696	138	753	112	616
9,500	137	764	116	644	124	696	135	753	109	618

TABLE 4-64

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 4000 FT TEMPERATURE: -25 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER-EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	102	556	130	854	132	885	119	713	120	723
6,000	96	544	126	854	128	885	115	713	120	766
7,000	96	582	122	854	124	885	111	713	120	820
7,500	95	593	120	854	122	885	109	713	120	853
8,000	94	604	117	854	120	885	106	713	120	889
8,500	92	605	112	854	115	885	112	713	120	928
9,000	93	634	113	854	115	885	101	713	119	955
9,500	92	650	110	854	112	885	99	713	117	956

TABLE 4-65

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 4000 FT TEMPERATURE: 5 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	120	603	137	766	142	820	132	721	123	626
6,000	113	587	134	766	139	820	129	721	123	662
7,000	107	579	130	766	135	820	125	721	123	697
7,500	105	581	127	766	132	820	123	721	123	720
8,000	104	587	125	766	130	820	120	721	120	721
8,500	102	631	122	766	127	820	118	721	118	722
9,000	103	627	120	766	125	820	115	721	115	722
9,500	101	630	118	766	123	820	113	721	113	722

TABLE 4-66

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	130	618	139	678	146	734	145	728	119	562
6,000	130	636	136	678	142	734	141	728	119	577
7,000	124	627	131	678	138	734	137	728	119	598
7,500	123	638	129	678	136	734	135	728	119	611
8,000	119	630	126	678	133	734	133	728	117	617
8,500	117	636	124	678	131	734	130	728	114	615
9,000	117	645	121	678	129	734	128	728	112	612
9,500	122	704	119	678	126	734	125	728	109	622

TABLE 4-67

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 4000 FT TEMPERATURE: 35 C
AIRCRAFT - UH-1H
HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	139	633	132	597	141	645	155	735	116	526
6,000	140	653	129	597	138	645	153	735	116	540
7,000	140	681	124	597	134	645	149	735	116	560
7,500	140	693	122	597	132	645	147	735	116	571
8,000	139	700	120	597	130	645	145	735	113	570
8,500	138	704	119	597	127	645	142	735	111	570
9,000	136	714	114	597	124	645	139	735	108	574
9,500	134	733	108	597	119	645	135	735	105	584

TABLE 4-68

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: -25 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	99	510	129	796	131	830	121	498	123	718
6,000	94	508	125	796	127	830	117	498	123	771
7,000	95	551	120	796	122	830	112	498	123	836
7,500	94	562	117	796	120	830	109	498	123	876
8,000	91	557	111	796	115	830	107	498	120	879
8,500	93	594	112	796	114	830	104	498	118	882
9,000	92	609	109	796	112	830	101	498	115	884
9,500	91	630	106	796	109	830	98	498	113	886

TABLE 4-69

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 6000 FT TEMPERATURE: -5 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	114	538	136	711	141	764	135	705	119	573
6,000	113	552	132	711	137	764	132	705	119	600
7,000	108	539	127	711	132	764	127	705	119	640
7,500	104	546	125	711	130	764	124	705	119	664
8,000	106	586	122	711	127	764	121	705	117	665
8,500	102	582	119	711	124	764	119	705	114	666
9,000	100	587	117	711	122	764	116	705	111	667
9,500	105	642	113	711	119	764	113	705	109	673

TABLE 4-70

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 6000 FT TEMPERATURE: 15 C
AIRCRAFT - UH-1H
HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	130	580	137	628	144	680	148	713	115	510
6,000	130	600	134	628	140	680	144	713	115	527
7,000	123	593	129	628	135	680	140	713	115	549
7,500	118	585	125	628	133	680	137	713	115	568
8,000	117	592	123	628	131	680	135	713	113	565
8,500	114	601	121	628	128	680	132	713	110	564
9,000	121	658	117	628	125	680	129	713	107	576
9,500	115	648	112	628	119	680	124	713	105	585

TABLE 4-71

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 6000 FT TEMPERATURE: 35 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	139	593	131	553	140	597	160	719	112	478
6,000	140	618	127	553	136	597	157	719	112	494
7,000	140	644	121	553	131	597	152	719	112	515
7,500	139	650	119	553	129	597	150	719	112	525
8,000	137	655	117	553	126	597	148	719	109	526
8,500	136	668	112	553	122	597	144	719	106	532
9,000	133	688	105	553	116	597	138	719	103	544
9,500	131	719	99	553	109	597	131	719	101	563

TABLE 4-72

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 8000 FT TEMPERATURE: -25 C
AIRCRAFT - UH-1H
HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	96	468	127	739	130	778	123	686	119	645
6,000	96	500	123	739	126	778	118	686	119	697
7,000	94	522	117	739	120	778	113	686	119	746
7,500	93	537	114	739	117	778	110	686	119	805
8,000	93	555	111	739	114	778	107	686	117	810
8,500	91	570	108	739	112	778	104	686	114	813
9,000	91	595	105	739	109	778	101	686	112	817
9,500	91	629	102	739	105	778	98	686	109	826

TABLE 4-73

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 8000 FT TEMPERATURE: -5 C
AIRCRAFT - UH-1H
HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	113	503	135	659	139	705	138	691	115	514
6,000	107	498	130	659	135	705	133	691	115	546
7,000	103	507	124	659	129	705	128	691	115	588
7,500	105	542	121	659	126	705	125	691	115	610
8,000	102	540	119	659	124	705	122	691	113	611
8,500	99	543	116	659	121	705	119	691	110	615
9,000	104	605	112	659	117	705	116	691	107	624
9,500	104	632	107	659	112	705	111	691	105	638

TABLE 4-74

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 8000 FT TEMPERATURE: 15 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	130	544	136	580	142	627	152	698	111	462
6,000	124	539	131	580	138	627	147	698	111	481
7,000	118	543	125	580	132	627	142	698	111	506
7,500	117	550	122	580	130	627	139	698	111	518
8,000	116	559	119	580	127	627	136	698	108	519
8,500	120	614	115	580	123	627	132	698	106	532
9,000	112	595	109	580	116	627	126	698	103	543
9,500	115	664	102	580	110	627	120	698	100	571

TABLE 4-75

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 8000 FT TEMPERATURE: 35 C
AIRCRAFT - UH-1H
HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	150	558	129	510	138	552	165	704	107	435
6,000	140	585	124	510	134	552	160	704	107	452
7,000	139	603	118	510	129	552	156	704	107	473
7,500	137	608	116	510	126	552	153	704	107	484
8,000	135	625	110	510	121	552	148	704	104	492
8,500	132	646	102	510	114	552	141	704	101	506
9,000	132	688	93	510	105	552	134	704	99	529
9,500	122	730	78	510	90	552	119	704	96	576

TABLE 4-76

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 10000 FT TEMPERATURE: -25 C
AIRCRAFT - UH-1H
HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	95	435	125	684	129	723	125	677	115	578
6,000	98	473	120	684	123	723	120	677	115	630
7,000	93	499	114	684	117	723	113	677	115	700
7,500	92	516	111	684	114	723	110	677	115	739
8,000	91	533	108	684	111	723	107	677	113	744
8,500	91	561	104	684	108	723	104	677	110	751
9,000	92	599	101	684	104	723	100	677	107	763
9,500	92	640	84	684	99	723	82	677	105	783

TABLE 4-77

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 10000 FT TEMPERATURE: -5 C
AIRCRAFT - UH-1H
HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	113	471	133	608	138	651	141	681	111	460
6,000	105	462	127	608	132	651	135	681	111	497
7,000	105	501	121	608	126	651	129	681	111	537
7,500	101	501	118	608	123	651	126	681	111	559
8,000	105	544	114	608	120	651	123	681	108	565
8,500	104	569	110	608	115	651	119	681	105	576
9,000	102	593	105	608	110	651	113	681	103	593
9,500	102	636	98	608	104	651	107	681	100	620

TABLE 4-78

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 10000 FT TEMPERATURE: 15 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	130	511	134	535	141	579	155	685	107	418
6,000	123	509	128	535	135	579	150	685	107	439
7,000	117	511	121	535	129	579	144	685	107	462
7,500	122	558	118	535	126	579	141	685	107	482
8,000	119	567	113	535	121	579	136	685	104	490
8,500	109	550	107	535	114	579	129	685	101	503
9,000	115	637	98	535	106	579	122	685	98	537
9,500	101	634	84	535	94	579	108	685	95	593

TABLE 4-79

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: 10000 FT TEMPERATURE: 35 C

AIRCRAFT - UH-1H

HUEY

GROSS WEIGHTS (LBS)	LONG RANGE		MAX CONTINUOUS POWER		MAX POWER (ENGINE)		TRANSMISSION LIMITS		VELOCITY NEVER EXCEED	
	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
5,000	140	526	127	471	136	509	170	690	102	395
6,000	140	552	120	471	130	509	164	690	102	414
7,000	137	564	115	471	124	509	159	690	102	436
7,500	135	582	108	471	119	509	153	690	102	453
8,000	131	606	100	471	111	509	146	690	99	469
8,500	131	660	85	471	99	509	136	690	96	499
9,000	110	659	0	471	81	509	114	690	93	556
9,500	93	660	0	471	0	509	96	690	90	637

APPENDIX A

FUNCTIONS FOR CALCULATING BASIC FUEL FLOW

There are four functions that can be used to calculate the basic fuel flow for the UH-1H helicopter. In order to use the functions the following data is needed:

1. Flight Mode
2. Temperature
3. Pressure (altitude)
4. Gross weight

Which of the four functions will be used depends on the flight mode. The first function is for HIGE (Hover In Ground Effect).

$$FF\ (HIGE) = f\ (TEMP, ALT, GW)$$

The second function is for HOGE (Hover Out of Ground Effect).

$$FF\ (HOGE) = f\ (TEMP, ALT, GW)$$

The third function is for NOE (Nap of the Earth).

$$FF\ (NOE) = f\ (TEMP, ALT, GW)$$

The fourth function is for Forward Flight.

$$FF\ (Forward\ Flight) = f\ (AS, TEMP, ALT, GW)$$

The equation for FF (HIGE) is:

$$FF\ (HIGE) = A\ (ALT) + B\ (TEMP) + C\ (GW) + D\ (ALT)(TEMP) + E\ (ALT)\ (GW) + F\ (TEMP)\ (GW) + G\ (ALT)\ (TEMP)\ (GW) + K$$

Where ALT is the altitude, TEMP is the temperature and GW is the gross weight and the constants have the following values:

$A = -1.67887814 \times 10^{-2}$ $\quad E = 1.29600248 \times 10^{-6}$

$B = 4.10161592 \times 10^{-1}$ $\quad F = 3.0132207 \times 10^{-5}$

$C = 3.91685739 \times 10^{-2}$ $\quad G = 1.17938045 \times 10^{-8}$

$D = -8.21728881 \times 10^{-5}$ $\quad K = 2.92933769 \times 10^{2}$

The equation for FF (HOGE) is exactly the same form as FF (HIGE). A new set of values for the constants is used. These values are:

$A = -2.63614934 \times 10^{-2}$ $\quad E = 3.02673962 \times 10^{-6}$

$B = 1.93964556 \times 10^{-1}$ $\quad F = 6.59458456 \times 10^{-5}$

$C = 4.56838422 \times 10^{-2}$ $\quad G = 2.37175783 \times 10^{-8}$

$D = -1.43400082 \times 10^{-4}$ $\quad K = 2.74731071 \times 10^{2}$

The equation for FF (NOE) is once again the same as FF (HIGE). The new values for the constants are:

$A = -2.22641672 \times 10^{-2}$ $\quad E = 2.17353323 \times 10^{-6}$

$B = 2.23785236 \times 10^{-1}$ $\quad F = 3.08376766 \times 10^{-5}$

$C = 3.41005269 \times 10^{-2}$ $\quad G = 1.92344849 \times 10^{-8}$

$D = -1.20005595 \times 10^{-4}$ $\quad K = 3.02613983 \times 10^{2}$

For the Forward Flight modes the form of the equation is:

$$FF = A(AS) + B(AS^2) + C(AS^3) + D(TEMP) + E(GW) + F(ALT) + G(AS^3)(TEMP)$$
$$+ H(AS^2)(TEMP) + I(AS)(TEMP) + J(AS^3)(GW) + K(AS^2)(GW)$$
$$+ L(AS)(GW) + M(AS^3)(ALT) + N(AS^2)(ALT) + O(AS)(ALT) + P(TEMP)(GW)$$
$$+ Q(TEMP)(ALT) + R(GW)(ALT) + S(TEMP)(GW)(ALT) + T$$

Where AS is the air speed in kts and the values of the constants are:

$A = 1.59068222 \times 10$ $\quad K = 3.03806055 \times 10^{-5}$

$B = -2.07244817 \times 10^{-1}$ $\quad L = -2.6563704 \times 10^{-3}$

$C = 9.4490312 \times 10^{-4}$ $\quad M = -4.39906813 \times 10^{-8}$

$D = 1.39238681$ $\quad N = 1.01244432 \times 10^{-5}$

$E = 8.46537426 \times 10^{-2}$ $\quad O = -7.65462173 \times 10^{-4}$

$F = -3.69644095 \times 10^{-3}$ $\quad P = -1.80674342 \times 10^{-4}$

$G = -3.31475934 \times 10^{-6}$ $\quad Q = -2.52322902 \times 10^{-5}$

$H = 4.58021714 \times 10^{-6}$ $\quad R = 1.68428633 \times 10^{-6}$

$I = 1.22959614 \times 10^{-2}$ $\quad S = 1.34310624 \times 10^{-9}$

$J = -9.9763934 \times 10^{-8}$ $\quad T = -1.92733078 \times 10$

These functions allow anyone with a simple calculator to figure the fuel flow of the aircraft and bypass both looking up the values and interpolating for points in between the data points in the tables.

The above equations calculate the basic fuel flow for the HUEY helicopter with the following accuracies:

FF (HIGE) - 99.06%

FF (HOGE) - 96.45%

FF (NOE) - 97.22%

FF (Forward Flight) - 96.72%

APPENDIX B

FUNCTION FOR CALCULATING DELTA FUEL FLOW FOR DRAG

The function below will calculate the delta fuel flow for drag for the UH-1H helicopter. Recall from the discussion in chapter three that this value is added to the basic fuel flow value whenever drag is increasing the rate of fuel flow.*

In order to use the function the following data is needed:

1. Air Speed (AS)
2. Equivalent Square Footage of Drag (SQ)
3. Temperature (TEMP) in degrees centigrade
4. Altitude (ALT) in feet above sea level

That is:

$$FF\ (Drag) = f(AS, SQ, TEMP, ALT)$$

The equation for FF (Drag) is:

$$FF\ (Drag) = A(AS) + B(AS^2) + C(AS^3) + D(TEMP) + E(SQ) + F(ALT)$$
$$+ G(AS^3)(TEMP) + H(AS^2)(TEMP) + I(AS)(TEMP) + J(AS^3)(SQ) + K(AS^2)(SQ)$$
$$+ L(AS)(SQ) + M(AS^3)(ALT) + N(AS^2)(ALT) + O(AS)(ALT) + P(TEMP)(SQ)$$
$$+ Q(TEMP)(ALT) + R(SQ)(ALT) + S(SQ)(ALT)(TEMP) + T$$

Where the constants have the following values:

$A = 1.20850778$	$K = 1.6429491 \times 10^{-4}$
$B = -1.7245627 \times 10^{-2}$	$L = -3.931427 \times 10^{-2}$
$C = 9.34083073 \times 10^{-5}$	$M = -1.27597747 \times 10^{-8}$
$D = -7.75502279 \times 10^{-1}$	$N = 1.82550063 \times 10^{-6}$
$E = 2.63399982$	$O = -1.13339163 \times 10^{-4}$
$F = 9.42266406 \times 10^{-3}$	$P = -2.40131395 \times 10^{-2}$
$G = 1.68433911 \times 10^{-6}$	$Q = -1.68563065 \times 10^{-6}$
$H = -5.68644718 \times 10^{-4}$	$R = -2.57801366 \times 10^{-4}$
$I = 4.71237898 \times 10^{-2}$	$S = 2.58660063 \times 10^{-6}$
$J = 5.16584009 \times 10^{-6}$	$T = -6.4234005 \times 10$

*There is no delta fuel flow for drag for HIGE, HOGE, or NOE flight.

This equation calculates the delta fuel flow for drag value with an accuracy of 98.25%. It should be noted that in some instances the computed value wiil be negative. If this occurs, zero (Ø) should be used as the value for delta fuel flow.

APPENDIX C

FUNCTION FOR CALCULATING GROUND IDLE FUEL FLOW

The function below will calculate the ground idle fuel flow rate for the UH-1H helicopter. In order to use the function the following data is needed:

1. Temperature (TEMP) in degrees centigrade.

2. Altitude (ALT) in feet above sea level.

That is:

$$FF\ (Idle) = f\ (TEMP, ALT)$$

The equation, for FF (Idle) is:

$$FF\ (Idle) = A(TEMP) + B(ALT) + C(TEMP)(ALT) + D(TEMP^2) + E(ALT^2) + F$$

Where the constants have the following values:

$A = 1.45684561 \times 10^{-1}$ $\quad D = 3.12500328 \times 10^{-4}$

$B = -8.34276131 \times 10^{-3}$ $\quad E = 1.14954767 \times 10^{-7}$

$C = 5.07142136 \times 10^{-6}$ $\quad F = 3.23437859 \times 10^{2}$

This equation calculates the ground idle fuel flow rate with an accuracy of 99.95%.

APPENDIX D

FUNCTIONS FOR CALCULATING GROSS WEIGHT LIMITS FOR TAKEOFF

The functions given below will calculate the gross weight limits for take off for the UH-1H helicopter. Each of the functions is of the same basic form with the values of the constants changing depending on which take off criteria is being used. In all cases the Structural Gross Weight Limit of the UH-1H helicopter is 9,500 lbs.

In order to use the functions the following data is needed:

1. Temperature (TEMP) in degrees centigrade

2. Altitude (ALT) in feet above sea level

That is:

$$GW\ (Limit) = f\ (TEMP, ALT)$$

The basic equation for GW (Limit) is:

$$GW\ (Limit) = A(TEMP) + B(ALT) + C(TEMP)(ALT) + D$$

For take off criteria #1 the equation must be used twice, once using the engine limit constants and once using the transmission limit constants. For take off criteria #1 the constants for engine limits are:

$A = -6.85016747 \times 10$ $\quad C = 1.71550139 \times 10^{-3}$

$B = -3.70859645 \times 10^{-1}$ $\quad D = 1.18470441 \times 10^{4}$

For take off criteria #1 the constants for transmission limits are:

$A = -6.92928457$ $\quad C = -7.39143041 \times 10^{-4}$

$B = -1.22411422 \times 10^{-1}$ $\quad D = 9.99151526 \times 10^{3}$

For take off criteria #2 two checks must also be made. The constants for engine limits, take off criteria #2 are:

$A = -6.52326231 \times 10$ $\quad C = 1.13485783 \times 10^{-3}$

$B = -3.27509999 \times 10^{-1}$ $\quad D = 1.08683416 \times 10^{4}$

For take off criteria #2 the constants for transmission limits are:

$A = -4.73714191$ $\quad C = -8.22071597 \times 10^{-4}$

$B = -9.93717806 \times 10^{-2}$ $\quad D = 9.43963794 \times 10^{3}$

Also for take off criteria #3 two checks must be made. The constants for engine limits, take off criteria #3 are:

$A = -8.2112627 \times 10$ $\qquad C = 1.67585877 \times 10^{-3}$

$B = -4.10679288 \times 10^{-1}$ $\qquad D = 1.34328130 \times 10^{4}$

For take off criteria #3 the constants for transmission limits are:

$A = -6.72952366$ $\qquad C = -9.07928614 \times 10^{-4}$

$B = -1.10792495 \times 10^{-1}$ $\qquad D = 1.11857665 \times 10^{4}$

This equation with the various sets of constants gives results that are 95.62% accurate or better.

APPENDIX E

SHORT DESCRIPTION OF HUEY DATA SOURCE

DRDAV-EQA(A)
SUBJECT: Short Description of UH-1H Performance Data Provided to TRADOC Systems Analysis Activity (TRASANA)

MFR:

1. References:

a. Engineering Flight Test, UH-1H Helicopter; Phase D (Limited) USAASTA Project No. 66-04.

b. Determination of the Effects of Rotor Blade Compressibility on the Performance of the UH-1F; FTC-TR-65-17.

c. Operator's Manual, Army Model UH-1H Helicopter, TM55-1520-210-10.

2. The performance data presented to TRASANA is the result of combining the helicopter power required, engine power available and engine fuel flow characteristics. The UH-1H power required was calculated from a non-dimensional representation of engine power required (coefficient of power) v.s. gross weight (coefficient of thrust) and true airspeed (advance ratio). The non-dimensional power required was obtained from reference 1a. All performance in ground effect represents a 5 foot skid height. A temperature dependent correction, based on the method outlined in reference 1b, was made to the power required to account for compressibility which could not be accounted for in the non-dimensional representation.

3. The T53-L-13 engine power available to the UH-1H (which was used in combination with the power required to find helicopter take-off and speed limits) was used as a function of altitude and temperature, from reference 1a.

4. The engine fuel flow at a particular altitude and temperature combination was derived from a representative referred fuel flow as a function of referred engine power. The referred fuel flow curve for the T53-L-13 engine was taken from reference 1a. The calculated fuel flows reflect 5% conservatism. A referred parameter is one which is divided by temperature and pressure ratios in order to represent all atmospheric conditions by one function.

5. The never exceed speeds (Vn.e.) were calculated from those shown graphically in an unpublished new version of reference 1c.

6. The Structural Gross Weight limit of the UH-1H is 9500 lbs.

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